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EXAMINER	
ABEL JALIL, NEVEEN	
ART UNIT	**PAPER NUMBER**
2175	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/900,059	Applicant(s) HOEKMAN ET AL.	
	Examiner Neveen Abel-Jalil	Art Unit 2175	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-33 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-33 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Independent claims 6-16 are objected to because of the following informalities: Claims 18-20, and 27-29 need to be rewritten to include the missing elements of the claims they incorporate. For example, claim 18 should be rewritten to include the elements of claim 1 as stated in the claim. Claim 27 should be rewritten to include the elements of claim 21. Claim 19 should be rewritten to include the elements of claim 1. Claim 28 should be rewritten to include the elements of claim 21. etc. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-13, and 16-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Blum et al. (U.S. Patent No. 5, 918, 233).

As to claims 1, 18, 19, and 20, Blum et al. discloses a method for automatically classifying consonance of audio data, comprising:

applying audio data to a peak detection process (See column 1, lines 24-42, also see column 8, lines 25-40);

detecting the location of at least one prominent peak represented by the audio data in the frequency spectrum and determining the energy of the at least one prominent peak (See column 10, lines 22-67, and see column 30, also see column 7, lines 1-10);

storing the location of the at least one prominent peak and the energy of the at least one prominent peak into at least one output matrix (See column 2, lines 13-29, and see column 7, lines 1-28, also see column 3, lines 5-55);

applying the data stored in said at least one output matrix to critical band masking filtering (See column 2, lines 58-67, and see column 3, lines 1-29);

applying the data stored in said at least one output matrix to a peak continuation process (See column 6, lines 13-38); and

applying the data stored in said at least one output matrix to an intervals calculation process where the frequency of ratios between peaks are stored into an output vector for the audio data being classified (See column 5, lines 50-67, and see column 6, lines 1-10).

As to claim 2, Blum et al. discloses wherein the audio data is divided into frames, and the method is performed frame by frame (See column 6, lines 56-64).

As to claim 3, Blum et al. discloses wherein the frame by frame approach includes bin differencing to calculate frame derivatives to facilitate the detection of peaks (See column 8, lines 36-65).

As to claim 4, Blum et al. discloses wherein the number of peaks detected in said application of the peak detection process is limited by a pre-defined parameter (See column 3, lines 4-40).

As to claim 5, Blum et al. discloses comprising performing Nth order interpolation on the location of the at least one prominent peak and the energy of the at least one prominent peak to increase precision of the location and energy values for the peak (See column 9, lines 15-41, and see column 10, lines 27-56, also see column 3, lines 5-61).

As to claim 6, Blum et al. discloses comprising applying the output vector to a classification stage which determines at least one of (1) at least one consonance value and (2) at least one consonance class that describes the audio data (See column 6, lines 45-62, and see column 5, lines 50-62).

As to claim 7, Blum et al. discloses where the frequency of ratios between peaks are stored into an output vector that is 1 x 24 (See column 5, lines 50-61, wherein "vector that is 1 x 24" reads on "N-vector").

As to claim 8, Blum et al. discloses wherein the peak continuation process keeps track of peaks that last more than a predetermined number of frames (See column 24, lines 35-64, also see column 25, lines 35-55).

As to claim 9, Blum et al. discloses wherein the peak continuation process fills in a peak when the peak is missed in a previous frame (See column 7, lines 15-28, also see column 14, lines 56-67, and see column 15, lines 1-27).

As to claim 10, Blum et al. discloses wherein said critical band masking filtering removes a peak that is masked by surrounding peaks with more energy (See column 9, lines 44-67, and see column 10, lines 1-39).

As to claim 11, Blum et al. discloses wherein said critical band masking filtering removes a peak when at least one of a lower frequency peak and a higher frequency peak have greater energy (See column 8, lines 1-40, also see column 10, lines 22-56).

As to claim 12, Blum et al. discloses wherein said critical band masking filters are scalable so that the amount of masking is scalable (See column 13, lines 1-45).

As to claim 13, Blum et al. discloses wherein said storing includes providing an output of the peak detection and interpolation stage in two matrices, one holding the location of the at least one prominent peak, and the second holding the respective energy of the at least one prominent peak (See column 7, lines 1-30, also see column 8, lines 25-65).

As to claim 16, Blum et al. discloses comprising converting the input audio data from the time domain to the frequency domain (See column 24, lines 10-40).

As to claim 17, Blum et al. discloses wherein said converting of the input audio data signal from the time domain to the frequency domain includes performing a fast fourier transform on the audio data (See column 6, lines 55-64).

As to claims 21, 27, 28, and 29, Blum et al. discloses a method of classifying data according to consonance properties of the data, comprising:

assigning to each media entity of a plurality of media entities in a data set to at least one consonance class (See column 6, lines 45-62, and see column 5, lines 50-62);

processing each media entity of said data set to extract at least one consonance characteristic based on digital signal processing of each media entity (See column 3, lines 5-67, also see column 17, lines 9-63, and see column 22, lines 37-67);

generating a plurality of consonance vectors for said plurality of media entities, wherein each consonance vector includes said at least one consonance class and at least one consonance characteristic based on digital signal processing (See column 24, lines 10-25, also see column 6, lines 13-38); and

forming a classification chain based upon said plurality of feature vectors (See column 25, lines 7-32, also see column 25, lines 35-67).

As to claim 22, Blum et al. discloses comprising:

processing an unclassified media entity to extract at least one consonance characteristic based on digital signal processing of the unclassified media entity (See column 3, lines 5-67, also see column 17, lines 9-63, and see column 22, lines 37-67);

generating a vector for the unclassified media entity including said at least one digital signal processing consonance characteristic (See column 6, lines 13-38);

presenting the vector for the unclassified media entity to the classification chain (See column 24, lines 10-25); and

classifying the unclassified entry with an estimate of the consonance class by calculating the representative consonance class of the subset of the plurality of vectors of the classification chain located in the neighborhood of the vector for the unclassified entity (See column 23, lines 10-67).

As to claim 23, Blum et al. discloses including, calculating a neighborhood distance that defines a distance within which two vectors in the classification chain space are in the same neighborhood for purposes of being in the same consonance class (See column 25, lines 7-32, also see column 25, lines 35-67).

As to claim 24, Blum et al. discloses wherein said classifying of the unclassified entry includes classifying the unclassified entity with a median consonance class represented by the neighborhood (See column 25, lines 58-67, and see column 26, lines 1-45).

As to claim 25, Blum et al. discloses wherein said consonance class is described by a numerical value and said classifying of the unclassified entry includes classifying the unclassified entry with a mean of numerical consonance values found in the neighborhood (See column 25, lines 7-32, also see column 25, lines 35-67).

As to claim 26, Blum et al. discloses wherein said classifying includes returning at least one number indicating the level of confidence of the consonance class estimate (See column 11, lines 1-67, and see column 12, lines 1-50, also see column 17, lines 20-65).

As to claim 30, Blum et al. discloses a computing system, comprising:

a computing device including:

a classification chain data structure stored thereon having a plurality of classification vectors, wherein each vector includes data representative of a consonance class as classified by humans and consonance characteristics as determined by digital signal processing (See column 3, lines 5-67, also see column 17, lines 9-63); and

processing means for comparing an unclassified media entity to the classification chain data structure to determine an estimate of the consonance class of the unclassified media entity (See column 22, lines 31-67).

As to claim 31, Blum et al. discloses wherein said determining of an estimate of the consonance class includes returning at least one number indicating the level of confidence of the consonance class assignment (See column 14, lines 21-36).

As to claim 32, Blum et al. discloses wherein the performance level of the classification chain improves over time due to the examination of unclassified media

entities that have a low confidence level associated with the consonance class assignment (See column 23, lines 10-67, and see column 23, lines 1-67, and see column 24, lines 7).

As to claim 33, Blum et al. discloses a classification chain data structure utilized in connection with the classification of consonance of new unclassified media entities, comprising:

a plurality of classification vectors (See column 3, lines 5-34), wherein each vector includes:

consonance data as classified by humans (See column 3, lines 30-67); and

consonance data determined by digital signal processing techniques (See column 6, lines 14-67).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum et al. (U.S. Patent No. 5, 918, 233) in view of ST. JOHN (U.S. Pub. No. 2003/0023444 A1).

As to claim 14, Blum et al. does not teach wherein the audio data is formatted according to pulse code modulated format.

ST. JOHN teaches wherein the audio data is formatted according to pulse code modulated format (See page 18, paragraphs 0242-0245).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Blum et al. to include wherein the audio data is formatted according to pulse code modulated format.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Blum et al. by the teaching of ST. JOHN to include wherein the audio data is formatted according to pulse code modulated format because converting analog natural voice signals to digital computerized segments allows for more efficient storage and classification of audio sounds.

As to claim 15, Blum et al. as modified discloses wherein the audio data is previously in a format other than pulse code modulated format, and the method further comprises converting the audio data to pulse code modulated format from the other format (See page 18, paragraphs 0242-0245).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nakae et al. (U.S. Patent No. 5,157,215) teaches electronic musical instrument for modulating musical tone signal with voice.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neveen Abel-Jalil whose telephone number is 703-305-8114. The examiner can normally be reached on 8:00AM-4: 30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on 703-305-3830. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Neveen Abel-Jalil
February 12, 2004

CHARLES RONES
PRIMARY EXAMINER